



Indiana Department of Education

Glenda Ritz, NBCT
Indiana Superintendent of Public Instruction

K-2 Mathematics Resources to Extend and Enrich the Core Curriculum Appropriate for High Ability Students Indiana Academic Standard Strand:

Geometry

Resource	Annotation	Differentiation Tip(s)	Correlating Indiana Academic Strand Standards	Correlating Indiana Academic Process Standards
<p>AIMS Education Foundation (2007) <i>Solve It! K-1: Problem Solving Strategies</i>. Fresno, CA: AIMS Education Foundation. www.aimsedu.org</p> <p><i>Also found in:</i></p> <ul style="list-style-type: none"> • <i>Measurement</i> • <i>Data Analysis</i> • <i>Number Sense</i> • <i>Computation and Algebraic Thinking</i> 	<p>This resource includes 29 activities designed to introduce and develop the following eight problem solving strategies:</p> <ul style="list-style-type: none"> • Guess and Check • Look for Patterns • Use Manipulatives • Draw Out the Problem • Use Logical Thinking • Write a Number Sentence • Work Backwards • Organize the Information <p>Through involvement in the</p>	<p><i>Tiered Delivery:</i> The “Management” section of each activity provides specific suggestions on how to adjust the challenge level specific to that activity.</p> <p><i>Flexible Grouping:</i> Arrange students in like-ability partners or small groups to work on problem solving activities.</p> <p><i>Self-Pacing:</i> Allow individuals/partners/small</p>	<p>K.G.1; K.G.2; K.G.3; K.G.4 1.G.2; 1.G.3</p>	<p>PS.1; PS.2; PS.3; PS.4; PS.5; PS.6; PS.7; PS.8</p>

	activities, students apply grade-level academic strand content skills. This resource is ideal for math club use.	groups to work through the activities related to each problem solving strategy as fast and as far as they are able. Incorporate additional grade level AIMS Solve It! activities, as needed, for acceleration beyond the second grade level. (See “3-5 Mathematics Resources to Extend and Enrich the Core Curriculum Appropriate for High Ability Students”)		
<p>AIMS Education Foundation (2008) <i>Solve It! 2nd: Problem Solving Strategies</i>. Fresno, CA: AIMS Education Foundation. www.aimsedu.org</p> <p><i>Also found in:</i></p> <ul style="list-style-type: none"> • <i>Measurement</i> • <i>Data Analysis</i> • <i>Number Sense</i> • <i>Computation and Algebraic Thinking</i> 	<p>This resource includes 28 activities designed to introduce and develop the following nine problem solving strategies:</p> <ul style="list-style-type: none"> • Guess and Check • Look for Patterns • Use Manipulatives • Draw Out the Problem • Write a Number Sentence • Use Logical Thinking • Organize the Information • Work Backwards • Wish for an Easier Problem <p>Through involvement in the activities, students apply grade-level academic strand content skills. This resource is ideal for</p>	<p><i>Tiered Delivery:</i> The “Management” section of each activity provides specific suggestions on how to adjust the challenge level specific to that activity.</p> <p><i>Flexible Grouping:</i> Arrange students in like-ability partners or small groups to work on problem solving activities.</p> <p><i>Self-Pacing:</i> Allow individuals/partners/small groups to work through the activities related to each problem solving strategy as fast and as far as they are able. Incorporate</p>	<p>1.G.2; 1.G.3; 1.G.4</p> <p>2.G.1; 2.G.2; 2.G.3; 2.G.5</p>	<p>PS.1; PS.2; PS.3; PS.4; PS.5; PS.6; PS.7; PS.8</p>

	math club use.	additional grade level AIMS Solve It! activities, as needed, for acceleration beyond the second grade level. (See “3-5 Mathematics Resources to Extend and Enrich the Core Curriculum Appropriate for High Ability Students”)		
<p>Cook, M. (2008) <i>Count & Place: Sides and Shapes.</i> Balboa Island, CA: Marcy Cook Math. www.marcycookmath.com</p> <p><i>Also found in:</i></p> <ul style="list-style-type: none"> • <i>Number Sense</i> • <i>Computation and Algebraic Thinking</i> 	<p>In the second section of this resource, there are 40 activities in which students are shown which pattern block shapes to use in building a polygon with an indicated number of sides. Two different polygons will be built per activity. The activities are progressively more difficult throughout this section. The first 20 tasks use 3 pattern blocks per polygon and the latter 20 tasks use 4 pattern blocks per polygon. Tracking sheets are included to keep track of task completion progress. These activities are ideal for independent task time or partner problem-solving.</p>	<p><i>Tiered Delivery:</i> Students needing less of a challenge can be assigned any activities from 1-20, and students needing more of a challenge can be assigned any activities from 21-40.</p> <p><i>Self-Pacing:</i> Individuals or like-ability partners can work through all of the activities in order from either 1-40, 1-20, or 21-40, whichever is appropriate, using the corresponding tracking sheet(s) to keep track of task completion.</p> <p><i>Choice:</i> Provide students all activities (i.e., laminated copies) and allow them to choose which ones they would like to complete. Explain to</p>	<p>K.G.1; K.G.2; K.G.3; K.G.4</p> <p>1.G.2; 1.G.3</p> <p>2.G.1; 2.G.2; 2.G.3</p>	<p>PS.1; P.S.2; P.S.4; P.S.5; P.S.6; P.S.7; P.S.8</p>

		students that the activities 1-20 are less difficult and the activities 21-40 are more difficult.		
<p>Cook, M. (1994) Early Tangram Geometry. Balboa Island, CA: Marcy Cook Math. www.marcycookmath.com</p>	<p>This resource contains 20 progressively difficult task cards that partners use, each with a complete set of tangrams, to solve geometry challenges. Each card indicates the number of tangram pieces each partner contributes to form a specified shape/shapes. A tracking sheet to record task completion is included. Because of the geometry vocabulary used, this resource is most appropriate for grade 2. For grades K and 1, see the similar resources “Shape Up (Tangrams)” and “Two for Tangrams.”</p>	<p>Flexible Grouping: Arrange students in like-ability partners to work on solving the tangram challenges.</p> <p>Self-Pacing: Like-ability partners can work through all of the task cards in order from 1-20, using the tracking sheet to keep track of task completion.</p> <p>Choice: Provide partners all task cards, and allow them to choose which ones they would like to complete, using the tracking sheet to keep track of task completion. Explain to students that the higher the task card number is, the more difficult the challenge.</p>	<p>K.G.1; K.G.2; K.G.3; K.G.4</p> <p>1.G.1; 1.G.2; 1.G.3</p> <p>2.G.1; 2.G.2; 2.G.3</p>	<p>PS.1; PS.3; PS.6; PS.7; PS.8</p>
<p>Cook, M. (1994) Shapes & Logic: Young Geometry. Balboa Island, CA: Marcy</p>	<p>In the second section of this resource, students use pattern blocks to cover polygons in the</p>	<p>Self-Pacing: Individuals or like-ability partners can work through the 20 “Least</p>	<p>K.G.4</p> <p>1.G.3</p>	<p>PS.1; PS.3; PS.4; PS.6; PS.7; PS.8</p>

<p>Cook Math. www.marcycookmath.com</p> <p><i>Also found in:</i></p> <ul style="list-style-type: none"> Reasoning, Logic, Problem Solving, Visual Spatial, and Strategic Thinking Computation and Algebraic Thinking 	<p>following ways, which adds the element of mathematical reasoning and problem solving:</p> <ul style="list-style-type: none"> use the least (minimum) number of blocks or use the most (maximum) number of blocks (referred to as “LEAST AND MOST”) use specific numbers of colors and blocks (referred to as “NUMBERS AND SHAPES”) <p>There are 20 challenges, and a tracking sheet for task completion is included. This resource is ideal for independent task time or partner problem solving.</p>	<p>and Most” and “Numbers and Shapes” challenges in any order, using the tracking sheet to keep track of task completion.</p> <p>Choice: Provide students all task cards (laminated copies), and allow them to choose which ones they would like to complete, using the tracking sheet to keep track of task completion.</p>	<p>2.G.3</p>	
<p>Cook, M. (no date) <i>Shape Up (Tangrams)</i>. Balboa Island, CA: Marcy Cook Math. www.marcycookmath.com</p>	<p>This resource contains 20 progressively difficult “make the design” with tangrams task cards. Cards 1-5 have all of the lines for tangram placement drawn, cards 6-16 have some of the lines for tangram placement drawn, and cards 17-20 have only the external lines drawn. A tracking sheet to record task completion is included. This resource is most appropriate for Kindergarten.</p>	<p>Self-Pacing: Students can work through all of the task cards in order from 1-20, using the tracking sheet to keep track of task completion.</p> <p>Choice: Provide students all task cards, and allow them to choose which ones they would like to complete, using the tracking sheet to keep track of task completion. Explain</p>	<p>K.G.4 1.G.3 2.G.3</p>	<p>PS.1; PS.3; PS.6; PS.7; PS.8</p>

		to students the three levels of challenge.		
<p>Cook, M. (1992) <i>Two For Tangrams</i>. Balboa Island, CA: Marcy Cook Math. www.marcycookmath.com</p>	<p>This resource contains 20 progressively difficult task cards that partners use, each with a complete set of tangrams, to solve geometry challenges. Each card indicates the number of tangram pieces each partner contributes to form a specified shape. A tracking sheet to record task completion is included.</p>	<p><i>Flexible Grouping:</i> Arrange students in like-ability partners to work on solving the tangram challenges.</p> <p><i>Self-Pacing:</i> Like-ability partners can work through all of the task cards in order from 1-20, using the tracking sheet to keep track of task completion.</p> <p><i>Choice:</i> Provide partners all task cards, and allow them to choose which ones they would like to complete, using the tracking sheet to keep track of task completion. Explain to students that the higher the task card number is, the more difficult the challenge.</p>	<p>K.G.4 1.G.3 2.G.3</p>	<p>PS.1; PS.3; PS.6; PS.7; PS.8</p>
<p>Duea, J. and Ockenga, E. (1999) <i>Nifty Problem Card Deck (Levels A-F)</i>. Edmonds, WA: Joyful Noise</p>	<p>This program offers six grade levels of problem-solving cards for K/1-6. Each level contains 72 task cards, recording sheets, answer</p>	<p><i>Flexible Grouping:</i> Assign like-ability partners to work through the problem-solving cards.</p>	<p>K.G.2 1.G.1</p>	<p>PS.1; PS.2; PS.3; PS.4; PS.5; PS.6; PS.7; PS.8</p>

<p>Publications. www.shop.joyful-noise.com</p> <p>Also found in:</p> <ul style="list-style-type: none"> • <i>Measurement</i> • <i>Data Analysis</i> • <i>Number Sense</i> • <i>Computation and Algebraic Thinking</i> 	<p>keys, transparency masters, blackline masters, and teaching notes. These cards are ideal for running a cooperative self-paced problem-solving program.</p>	<p><i>Self-Pacing:</i> Individuals or like-ability partners can progress through the cards in each level at their own pace, keeping track of their progress and moving through the cards as far as they are able.</p>	2.G.1	
<p>Findell, C.R., et al (2001) <i>Navigating through Geometry in Prekindergarten-Grade 2.</i> Reston, VA: The National Council of Teachers of Mathematics, Inc. www.nctm.org (ISBN: 0-87353-511-1)</p>	<p>This resource includes activities that introduce, develop, and extend the fundamental ideas of geometry. Activities are divided into the following chapters:</p> <ul style="list-style-type: none"> • Two- and Three-Dimensional Shapes • Location and Position • Transformations and Symmetry • Visualization, Spatial Reasoning, and Modeling <p>Blackline Masters are included.</p>	<p><i>Tiered delivery:</i> Match the grade level resource most appropriate to the readiness level of students. For the third through sixth grade levels of this resource, see “3-5 Mathematics Resources to Extend and Enrich the Core Curriculum Appropriate for High Ability Students.”</p> <p><i>Extend:</i> This resource is appropriate for all students. See the “Extend” section of each activity for additional challenging activities appropriate for high ability math students.</p>	<p>K.G.1; K.G.2; K.G.3; K.G.4 1.G.1; 1.G.2; 1.G.3 2.G.1; 2.G.2; 2.G.3</p>	<p>PS.1; PS.2; PS.3; PS.4; PS.5; PS.6; PS.7; PS.8</p>
<p>Jackson, P., et al (2011) <i>Origami Zoo: 25 Fun Paper Animal Creations.</i></p>	<p>This resource contains “very simple,” “simple,” “intermediate,”</p>	<p><i>Choice:</i> Allow students to choose the</p>	<p>K.G.1; K.G.2; K.G.3</p>	<p>PS.1; PS.2; PS.3; PS.4;</p>

Layton, UT: Gibbs Smith. www.gibbs-smith.com (ISBN: 978-1-4236-2016-7)	and “advanced” paper folding animal projects. The directions are clear and appropriate for primary elementary students.	projects that match their skill levels.	1.G.2; 1.G.3 2.G.1; 2.G.2; 2.G.3	PS.5; PS.6; PS.7; PS.8
Gavin, M.K., et al (2011) (Project M2: Mentoring Young Mathematicians) Exploring Shapes in Space: Geometry with the Frogonauts: Level K. Dubuque, IA: Kendall Hunt Publishing Company. www.kendallhunt.com	This kindergarten supplemental geometry unit Exploring Shapes in Space: Geometry with the Frogonauts fits in with the <i>M2: Mentoring Young Mathematicians</i> measurement K-2 unit sequence. The kindergarten unit was unavailable for review.	N/A	N/A	N/A
Gavin, M.K., et al (2011) (Project M2: Mentoring Young Mathematicians) Exploring Shape Games: Geometry With Imi And Zani: Level 1. Dubuque, IA: Kendall Hunt Publishing Company. www.kendallhunt.com (ISBN: 978-0-7575-8822-8)	In this supplemental geometry unit, students act as practicing mathematicians as they explore composing and decomposing 2-dimensional shapes; describing, sorting, and classifying shapes by their attributes; and investigating congruency and symmetry of 2-dimensional shapes through engaging, inquiry-based investigations. Throughout the unit, students work in whole-class, small group, and partner activities. A Teacher Guide,	Tiered Delivery: Utilize the unit’s Hint Cards and Think Beyond Cards.	1.G.1; 1.G.2; 1.G.3	PS.1; PS.2; PS.3; PS.4; PS.5; PS.6; PS.7; PS.8

	<p>Student Mathematician’s Journal, Hint Cards, Think Beyond Cards, and Word Wall Cards are available. The unit includes ideas for a culminating unit celebration. The unit is intended for first grade and takes approximately 31 60-minute sessions, or approximately 6 weeks to complete. Hint Cards support students who need more practice or additional instruction with skills or concepts, and Think Beyond Cards challenge students who have demonstrated mastery and are ready for an increased challenge.</p>			
<p>Gavin, M.K., et al (2011) <i>(Project M2: Mentoring Young Mathematicians)</i> <i>Designing a Shape Gallery: Geometry with the Meerkats: Level 2.</i> Dubuque, IA: Kendall Hunt Publishing Company. www.kendallhunt.com</p>	<p>This second grade supplemental geometry unit <i>Designing a Shape Gallery: Geometry with the Meerkats</i> fits in with the <i>M2: Mentoring Young Mathematicians</i> geometry K-2 unit sequence. The second grade unit was unavailable for review.</p>	N/A	N/A	N/A
<p>Robinson, N. (2003) <i>Absolute Beginner’s Origami: The Simple</i></p>	<p>This resource contains beginning-level paper folding animal projects, including a star box, a</p>	N/A	K.G.1; K.G.2; K.G.3	PS.1; PS.2; PS.3; PS.4; PS.5; PS.6;

<p><i>Three-Stage Guide to Creating Expert Origami.</i> New York, NY: Watson-Guptill Publications. www.watsonguptill.com (ISBN: 0-8230-0072-9)</p>	<p>boutonniere, a cube, a valentine vase, a bookmark, and a Santa. The directions are clear and appropriate for primary elementary students.</p>		<p>1.G.2; 1.G.3 2.G.1; 2.G.2; 2.G.3</p>	<p>PS.7; PS.8</p>
<p>Tonneson, V.C. (2013) <i>Splash! Modeling and Measurement Applications for Young Learners.</i> Waco, TX: Prufrock Press, Inc. www.prufrock.com (ISBN: 13: 978-1-61821-015-9)</p> <p><i>Also found in:</i></p> <ul style="list-style-type: none"> • <i>Measurement</i> 	<p>This resource is a unit intended for grades K and 1 consisting of 13 lessons that focus on linear measurement, fluid and flexible thinking, and the overarching concept of models. While involved in the unit, students explore and apply measurement skills as they work to design a community swimming pool.</p>	<p>N/A</p>	<p>K.G.2; K.G.3 1.G.1 2.G.1; 2.G.3</p>	<p>PS.1; PS.2; PS.3; PS.4; PS.5; PS.6; PS.7; PS.8</p>
<p>VandeCreek, B. (2001) <i>Math Rules! 1st-2nd.</i> Pieces of Learning: www.piecesoflearning.com. (ISBN: 978-1-880505-79-3)</p> <p><i>Also found in:</i></p> <ul style="list-style-type: none"> • <i>Measurement</i> • <i>Data Analysis</i> • <i>Number Sense</i> 	<p>This reproducible resource provides a year's worth of weekly 8-problem enrichment challenge worksheets for both first and second grade. The variety of problems covers standards from all content strands. These worksheets are ideal for homework use.</p>	<p><i>Tiered delivery:</i> Match the grade level resource most appropriate to the readiness level of students. For the third through sixth grade levels of this resource, see "3-5 Mathematics Resources to Extend and Enrich the Core Curriculum Appropriate for High Ability Students."</p>	<p>K.G.1; K.G.2 1.G.1; 1.G.3; 1.G.4 2.G.1; 2.G.3; 2.G.4; 2.G.5</p>	<p>PS.1; PS.2; PS.3; PS.4; PS.5; PS.6; PS.7; PS.8</p>

<ul style="list-style-type: none"> • <i>Computation and Algebraic Thinking</i> 				
<p>Zaccaro, Edward. (2003) Primary Grade Challenge Math. Bellevue, IA: Hickory Grove Press. www.challengemath.com (ISBN: 978-0-9679915-3-5)</p> <p><i>Also found in:</i></p> <ul style="list-style-type: none"> • <i>Measurement</i> • <i>Number Sense</i> • <i>Computation and Algebraic Thinking</i> 	<p>This resource includes 27 higher-level conceptual problem-solving challenges. Each is presented first as a whole-class introduction, followed by practice problems at the following four levels of challenge:</p> <p>Level 1 (easy) Level 2 (somewhat challenging) Level 3 (challenging) Genius (very challenging)</p> <p>Problem challenge topics include: sequences, problem solving, money, percents, algebraic thinking, negative numbers, logic ratios, probability, measurements, fractions, and division. Most appropriate for first and/or second grade.</p>	<p><i>Tiered Delivery:</i> Following the whole-class introduction to a specific type of problem, students can complete the appropriately leveled follow-up challenge independently or with a like-ability partner, choosing from one of the four difficulty levels.</p>	<p>1.G.4 2.G.5</p>	<p>PS.1; PS.2; PS.3; PS.4; PS.5; PS.6; PS.7; PS.8</p>